detail. However, in the present state of the subject, this is perhaps unavoidable, and we have to be grateful to the author for having brought together this mass of information scattered over many journals not usually consulted by the geneticist.

H. GRÜNEBERG

BIOCHEMISTRY

Mann, Thaddeus. *Biochemistry of Semen and of the Male Reproductive Tract.* Second edition. London, 1964. Methuen. Pp. xxiii + 493. Price 105s.

BERZELIUS, WRITING TO congratulate Wöhler on the synthesis of urea, suggested an extension of the synthetic programme: "Sollte es nun gelingen noch etwas weiter in Productionsvermögen zu kommen (*vesiculae seminales* liegen ja weiter nach vorn als die Urinblase), welche herrliche Kunst in Laborium der Gewerbeschule ein noch so kleines Kind zu machen." Synthesis of a homunculus was an old alchemical project in which few claimed success. We now know enough of the morphological complexity of sperm, let alone the zygote, to regard the project as even less probable than it seemed 136 years ago. Seminal plasma, on the other hand, seemed at one time to be a fluid that could be constructed, or at least simulated, artificially, and work on the problem was an obviously essential step towards trustworthy techniques for the artificial insemination of women and animals. In this second edition Dr. Mann shows how complex the problem is and the rate at which knowledge accumulates; the book has become three times bigger and the references have doubled to well over 2,000.

Far from being a simple medium that merely acts as a vehicle for conveying sperm into the female, seminal plasma turns out to be an active metabolic system in which, as the years go by, more and more enzymes are found. This makes it a happy hunting ground for teleologists. Some of these systems need refined methods for their detection but others are easily observed. Aristotle noticed that semen was at first fluid but quickly coagulated and liquefied again soon afterwards. He commented that the second phase was peculiar because things generally get more fluid when they are heated rather than cooled, but he was not sufficiently given to experiment to observe that semen does not coagulate again on reheating. He is, however, entitled to some credit for enzymic prescience, for he likened the mode of action of semen to that of fig juice or rennet in clotting milk. Seminal coagulation resembles, in some ways, blood-clotting—it comes about when a prostatic enzyme meets vesicular protein—but the latter is not clotted by thrombin nor is the former able to clot fibrinogen. We have here yet another example of what seems to be a common biological phenomenon: what appears to be the same physical problem, the production of a clot in this case, is solved by different biochemical methods not only in different species but even in different parts of one species. Semen also contains a battery of peptidases, phosphatases, nucleases and other enzymes; they are all interesting and none of them have, as yet, any obvious function.

Much of the book is devoted to an account of these enzyme systems and it is an admirable liberal education in general biochemistry. It is no criticism to add that those who have not learnt much biochemistry may find it difficult in places unless they have an ordinary textbook at hand. The extraordinary diversity of sperm morphology has long been known; animals could indeed be fairly precisely identified by their sperm alone. There is as great diversity in the chemical composition of semen. The number of species so far examined is too small for any attempt at generalization to be profitable, but it is already clear that the distribution of such components as citrate, ergothionine, fructose, inositol, sorbitol and spermine makes no sort of phylogenetic sense. Like the enzymes, most of these substances have no known function.

The sections of the book most relevant to eugenics deal with the factors that contribute to the fertilizing capacity of sperm, to their survival *in vitro* so as to make artificial insemination effective, and to their inhibition either before or after discharge so as to make contraception trustworthy. On all these themes Mann is lucid and informative. He describes attempts to separate X- from Y-bearing sperm, the composition and merits of different sperm diluents, the effects of nutrition and metabolic poisons on

sperm production, and the principles underlying diverse approaches to contraception. If there are still people who imagine that practically useful objectives are in some way inimical to first-rate research, and that scientists demean themselves when they forsake their customary remote and academic preoccupations, this book should enlighten them.

N. W. PIRIE

MIGRATION

Sutter, Jean (Editor). *Les Déplacements Humains. Aspects méthodologiques de leur mesure.* Paris, 1963. Hachette. Pp. xvi + 239. Price not stated.

THIS VOLUME PRESENTS the proceedings of the first session of the Entretiens de Monaco en Sciences Humaines which was held in May, 1962. The subject of the Conference was certain methodological aspects of the measurement of human population displacements, and the proceedings comprise fifteen original contributions preceded by an introduction by Professor Louis Chevalier of the Collège de France, president of the scientific council of the Conference, and followed by a summing-up by Professor Torsten Hägerstrand of the University of Lund.

The contributions begin with a paper by J. Saville dealing with the course of internal population migrations in England and Wales over the past hundred years and reviewing past attempts to quantify such movements from the country into the towns. On a wider scale, F. M. Salzano next deals with genetical aspects of Amerindian demography, reviewing what is known and what may be surmised regarding population density and community size in aboriginal America. Turning to the contemporary urban American scene, A. M. Katz and R. Hill contribute a mathematical analysis of residential propinquity and marital selection. The geographical aspects of human migration, and the possibilities of predicting future movements, are discussed by T. Hägerstrand with particular reference to Swedish data. A. J. Bateman evaluates the contribution to our knowledge of human migration that can be made by an analysis of data from plants and animals, and makes some interesting comments on the significance of annual holidays to human panmixia. The connection between mental health and population displacement is investigated by Y. Champion, and migration and inbreeding in Brazilian populations are surveyed by N. and A. Freire-Maia.

The remaining papers become increasingly mathematical and methodological and will interest the specialist more than the general student of human populational biology. Luu-Mau-Thanh and J. Sutter show how the distances between domiciles of spouses may be investigated, using data from a French *département*, whilst L. Cavalli Sforza, J. M. Goux and R. L. Morrill suggest models that can be constructed to elucidate migration distances. H. V. Muhsam uses factorial analysis as a tool in investigations of migration in open populations. The genetical implications of migration are further considered by L. Cavalli Sforza, N. E. Morton, N. Yasuda and G. Malécot. J. M. Goux makes the useful conceptual distinction between the "moving individual" ("le migrateur") and the "space of movement" ("l'espace de migration"). The role of electronic processing machines in contemporary migration studies is outlined by R. L. Morrill.

The volume is a bold attempt at breaking down the barriers between the mathematician and the empiricist. It will open the eyes of many students of mankind and its migrations to the rapidly expanding possibilities in the applications of mathematical analysis, together with computational aids, to problems of population migration and of predictions of the rate and direction of such movement.

D. R. HUGHES

PSYCHOLOGY

Wepman, J. M. and Heine, R. W. (Editors). *Concepts of Personality.* London, 1964. Methuen. Pp. xxix + 514. Price 70s.

HUMAN PERSONALITY HAS been studied by persons with an extraordinary diversity of theoretical backgrounds. There is little if any common ground between the views of the experimental psychologist or learning theorist, the psychometric approach to the measurement of traits and factors, the psycho-analyst or psychiatrist and clinical psychologist, the social anthropologist, the field theorist, and many others. However, there exists already a superb book by C. S. Hall and G. Lindzey, *Theories of*